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THE REPTILES OF THE MALTESE ISLANDS.

By G. Despott.

Of the vertebrates of Malta this is the class that is most poorly represented, numbering only seven species; amongst them, however, are found a variety and a form or two of particular interest, they being peculiar to some of the islets composing the Maltese group.

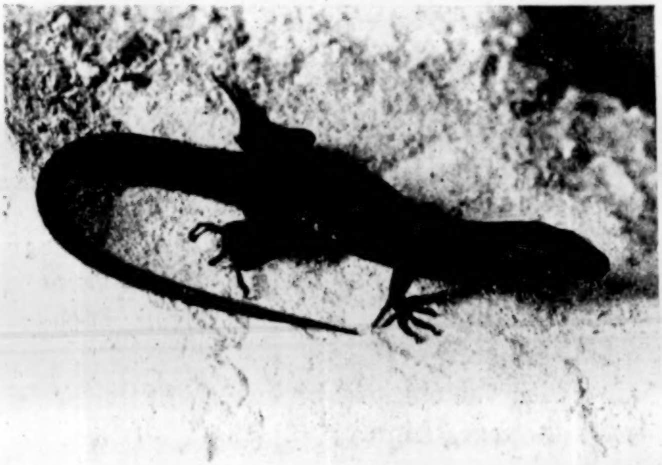
Beginning with the Geckos, we have: (1) the Turkish Gecko (*Hemidactylus turcicus*, Linn.); (2) the Wall-Gecko (*Tarentola mauritanica*, Linn.).

The Turkish Gecko is found more commonly inside houses, not only in villages but even in towns. According to my personal experience, I can say that this species is by no means common.

The Wall-Gecko is also met with at times inside houses; it prefers, however, the country, where it is rather abundant, inhabiting the crevices of rocks and old walls, out of which it emerges at twilight. Of this species, individuals are found of a very dark, almost black, colour; these seem to be more arboreal in their habits, showing a predilection for the old trunks of trees, orange trees especially.

Both these species are oviparous, laying two white hard-shelled eggs, the size of a moderately-sized pea. I often kept these eggs, which in due course hatched, independently, apparently, of a fixed temperature. The young of the Turkish Gecko are at first very dark and have banded tails. As they grow they become lighter in colour, and the bands on the tails gradually disappear.

It is a common belief here that both our Geckos have the power of inflicting leprosy on those who touch them; this is, however, only a prejudice, the poor creatures being perfectly harmless. This belief, however, is the cause of a most cruel persecution of these reptiles; and so general is it also that, no matter how good the offer one makes, he will find the greatest difficulty in getting a boy to collect Geckos for him.*



The Lizard from Filfola.

The typical Lizards are represented by one species with a variety and one or two forms, which are the following:—(1) the Wall-Lizard (*Lacerta muralis*, Laur.); (2) the Filfola Lizard (*Lacerta muralis* var. *filfolensis*, Bedr.); (3) the St. Paul's Islands Lizard; (4) the Fungus Rock Lizard (*Lacerta generalensis?*, Gulia).

The typical Wall-Lizard is abundant both in Malta, Gozo, and Comino, and it can be seen basking in the sun on almost any stone out in the country, even during the fine days of winter, hybernating (if its short disappearance during rainy days can be

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* Prof. Giglioli, of Florence, was of opinion that the *Phyllodactylus europæus* must be found in Malta. Dr. Giovanni Gulia, however, who made most diligent researches for it, states that he has not yet succeeded in finding a specimen, nor have I.

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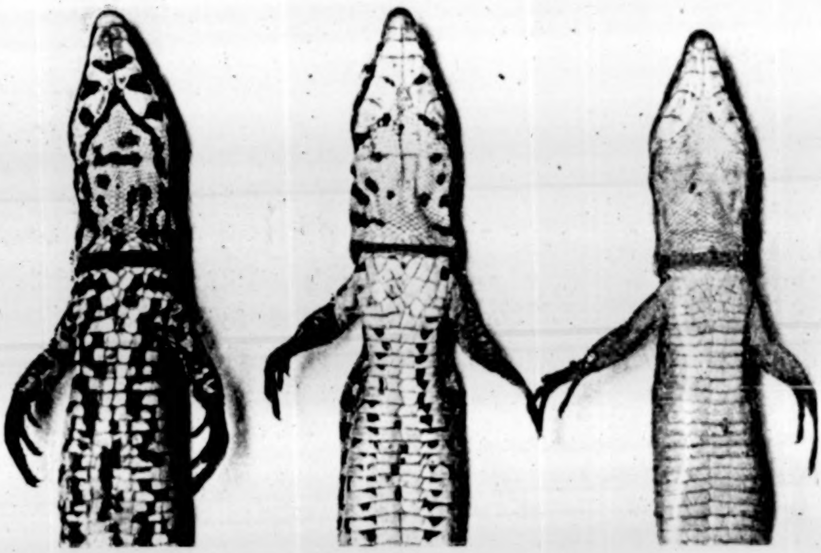
called hybernation) for a very short time. In colour this Lizard is so variable that it is most difficult to find two specimens perfectly alike. The females and young males are of a very sober colour, being brown, generally with longitudinal stripes of darker brown on the back, and whitish or bluish or yellowish white on the under parts. The adult males, during the spring especially, possess the most gorgeous hues; their emerald-green backs (in some being varied with black or yellow, or both) and their bright orange under parts, and their flanks of a most delicate cerulean blue, make them so conspicuously beautiful as to be admired even by those who shudder at the mere mention of the word Lizard.



1. Fungus Rock Lizard. 2. St. Paul's Islands Lizard.
3. Typical Wall-Lizard from Malta.

The Filfola Lizard, which is a variety of the species just described, is peculiar to Filfola, an islet about one mile in circumference, situated at not more than three miles away from the south coast of Malta. In size this variety surpasses the typical Wall-Lizard, often attaining a length of ten or even eleven inches. Its general colour is a deep charcoal black, having, however, markings in other colours which make it almost as variable as its congeners of Malta. Individuals entirely black, which are the rarest, have the flanks of a beautiful cobalt blue; the more common sorts have green, yellow, or yellowish green spots on the back, and in these the flanks are of a cerulean blue. The under parts are, in some, of a leaden grey; in others, yellowish; in others, a vivid light red or reddish brown; in some, again, the flanks and cheeks are of a delicate pea-green.

A very striking character in these Lizards is their remarkable tameness, which makes them so suitable for keeping in vivaria; I have never succeeded, however, in making them breed in captivity.

The Filfolas are known amongst English people by the name of Maltese Blue Lizards, owing perhaps to the blue on the flanks, which amount of colour is, in my opinion, not enough to justify such a name.

The majority of the Maltese believe that the Filfolas have a double tail; in fact, when they speak of Filfola, they state that the Lizards there, which they also know to be peculiar to that rock, possess a pair of tails, without saying anything of the special colour and dimensions. This belief is, of course, quite incorrect. A freak individual can be found at times; these freaks, however, can be met with also amongst the common Lizards, and the doubling of the tail can be also brought about artificially.

The St. Paul's Islands Lizard.—This form inhabits the islets at the mouth of St. Paul's Bay, and was noticed by me in 1913.* It is identical with the typical Wall-Lizard in nearly every respect, having as a peculiarity only some black spots on the under parts, which spots are not found in the common Lizards, and seem to be also wanting in young individuals of the present form; at least, among hundreds of young individuals I examined, I did not find one with any sign of black.

The Fungus Rock Lizard.—This most interesting form was discovered by Dr. Giovanni Gulia in 1914 on the Fungus or General's Rock, a steep little islet, only a few yards distant from the western coast of Gozo, and just at the mouth of the inlet called Cala Dwejra. In this Lizard the black spots on the under parts are still more confluent and conspicuous than those of the foregoing form, and so also are the black markings on the back. Both this and the form from the St. Paul's Islands seem to be very interesting links between the Filfolas and the typical Lizard of Malta. The name of *Lacerta generalensis*, given to this Lizard by its discoverer, seems to me not to be quite suitable, as it leads people to think it is a new species, while its characters are not even sufficient for taking it as a variety, though there is no doubt of its being a special and very important form.

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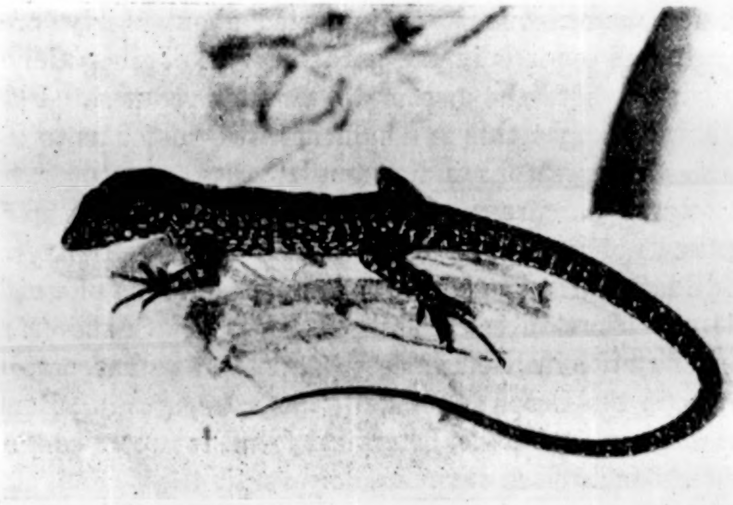
* Dr. J. De Bedriaga has told me of the existence in our islands of a Lizard with spotted under parts; its habitat, however, was not known.



Fungus Rock Lizard discovered lately by Dr. Gulia on the Fungus Rock (Gozo).

All these Lizards are oviparous, laying cartilaginous-shelled eggs. These are often laid by Lizards which are kept in confinement. I do not know, however, of a single instance of their having hatched.

The method used by the boys of Capri for taking Lizards is also used by all boys here.

The Skinks are represented by only one species: the Ocellated Skink (*Chalcides ocellatus*, Forsk.).

This Skink is common, especially in arid and sandy places. Specimens from Lampedusa are said to be of a light colour, while those from Linosa are dark; both light and dark individuals are found in Malta; the latter are, however, the more common. I do not think that this difference of colour is due to age or sex, for I have seen both light and dark individuals of all dimensions and of both sexes.

Of our reptiles, this is the species which thrives best in confinement, where it also breeds most freely; it is viviparous. The specimens I kept in my vivaria never produced more than four at each birth.

[Some Chamæleons were imported about thirty or forty years ago, and set free in the gardens of the Jesuits College at St. Julian's, where they seem to have reproduced. I do not think, however, that this is a sufficient reason for us to include the species amongst our indigenous reptiles; moreover, having tried lately to procure a specimen, I was told by the gardener that he had not seen a single one for the last five or six years.]

The Snakes are represented by two species, one of which has a variety. These are: (1) the Dark-green Snake (*Zamenis gemonensis*); with its black variety (*Z. gemonensis* var. *carbonaria*, Bonap.); (2) the Leopard Snake (*Coluber leopardinus*, Bonap.).

The Dark-green Snake, or typical form, is pretty common in the fields. Much more common, however, is the second, namely, the black variety. According to Dr. Gulia, this last is very common on some hills of Gozo.

The Leopard Snake is pretty frequent, but by no means common like the foregoing. It seems to prefer dark and sheltered localities, so much so that it is often found in cellars and other subterranean localities, not only in villages but also in the towns.

Of the two species of Snakes the last is the best for keeping in a vivarium; the first does not seem to be susceptible of domestication. It generally refuses to take any food, and its vicious character renders it by no means a sympathetic pet.

Both species are oviparous, laying cartilaginous-shelled eggs I have never seen the eggs laid by specimens in confinement.

[Giglioli found a specimen of the Cat-Snake (*Tarbophis vivax*) in Malta, and so Dr. Gulia includes the species with our reptiles, saying it is very rare. I do not think, however, that the finding of a single specimen entitles the species to form a part of our list; moreover, exotic individuals have been more than once introduced with imported hay, straw, &c.]

We come now to the Chelonians, which are represented by one species: the Loggerhead Turtle (*Thalassochelys caretta*, Linn.).

The Loggerhead Turtle is very common in our seas, and from August to November is taken in large numbers; in spring it also reappears, and has been known during that season to lay its eggs on our unfrequented sandy beaches, especially at Gozo. It is largely used as an article of food by the majority of the population.

[Dr. Gulia includes three species of Tortoises amongst our Chelonians, namely, the *Testudo græca*, which he says has been naturalized in such a way that it cannot be excluded from amongst our indigenous fauna. To this he says can be added the *T. mauritanica* and the *T. marginata*, which are often imported from the north coast of Africa. Dr. Gulia adds that the last species is rather rare. As regards the *T. mauritanica* and the *T. marginata*, there is surely no need of proofs to show that they have no right to be included in our list. As regards the *T. græca*, it is only found in gardens, where it is generally kept as a pet, and I am sure that no one ever found in Malta a Tortoise in a wild state.]

Malta having only one Batrachian, the Painted Frog (*Discoglossus pictus*, Otth.), it might be also included in this list. This Frog is very common, and in some localities it is most abundant, being found in myriads. It lives both in fresh and brackish water. The most peculiar fact about this Frog is that while in other countries it is said to spawn several times from March to October, in Malta it seems to spawn during the other four months too.

The following are the local names for the reptiles of Malta:—

Turkish Gecko = "Wizgha tad-diar."
Wall-Gecko = "Wizgha."
Wall-Lizard = "Gremxula."
Filfola Lizard = "Gremxula ta Filfla."
Ocellated Skink = "Xahmet l'art."
Dark-green Snake = "Serp."
Leopard Snake = "Lifgha."
Loggerhead Turtle = "Fecruna tal bahar."
Painted Frog = "Zring."

Note.—Dr. Gulia's list, alluded to above, is included in his very interesting note which was communicated to the Ninth International Zoological Congress held at Monaco in 1913, entitled, "Uno sguardo alla Zoologia delle 'Isole Maltesi.'"

MIGRATION AND OTHER ORNITHOLOGICAL NOTES FROM LOWESTOFT. (1914.)

By F. C. Cook.

When walking in the fields near the church on June 9th my attention was drawn to the curious movements of a Common Whitethroat, which was fluttering and running along the ground as if wounded. Thinking this to be a ruse to attract me from the spot, I peered into the hedge from whence she had first flown, and discovered four young Whitethroats scarce able to fly, and from whom, by her movements, the bird had evidently intended to allure me.

June 12th.—Several Common Terns, with their young (which they were feeding), on the shore.

14th.—A flock of twenty to thirty Wild Geese were seen flying over the town to the north.

15th.—A large movement of Starlings was witnessed; all were going south in flocks containing from twelve to twenty birds; these flocks appeared to me to have been composed chiefly of young birds of the year.

18th.—A greater number of Lesser Terns appear to have nested at Benacre this year. Our search for the Common Tern nesting here was fruitless, although many of them stayed in the vicinity all the summer; they were evidently non-breeding birds. Young Lesser Terns and Ringed Plovers were seen at Benacre.

19th.—Many flocks of Starlings were making southward, as they were also on the 20th, 21st, and 22nd. On the 23rd, besides many flocks of Starlings going south, one flock was noted going north, flying at a great altitude. A Spotted Flycatcher was seen on the Denes, and a Chiffchaff heard at Corton.

25th.—Starlings were again moving south, and several Ringed Plovers and Pied Wagtails were seen near the shore.

July 3rd.—I had the good fortune to observe a Spoonbill on

Breydon on this date, and had been watching it for some time through my glasses when it suddenly rose into the air with its legs hanging down as though something had attached itself to its foot (in all probability a crab) from whose grasp the much-surprised bird was endeavouring to rid itself. After wheeling around for several seconds it appeared to have shaken off its unwanted "hanger-on," for stretching its long legs straight out behind, it sailed off to another flat to resume its feeding with the more congenial companionship of a flock of Gulls.

15th.—Several Curlews were heard over the town at night.

26th.—An injured Black-headed Gull that has had the run of our garden for about six years captured and swallowed alive a young Sparrow. This Gull is also an adept at fly-catching; he will stand with head drawn in waiting for a fly to appear, when he at once darts out his head and is mostly successful in capturing the insect.

31st.—The cries of many Curlews and Dunlins were heard over the town at night.

August 10th.—A flock of ten Curlews were observed flying south along the shore during the afternoon; others were heard over the town at night, as they were also on the 11th.

14th.—Two Herons were seen going quite over the sea due east.

20th.—Three Wheatears, two Pied Wagtails, and about a dozen Lesser Terns had put in an appearance; flocks of Starlings were observed in the fields; two Whimbrel seen at Corton.

22nd.—The following migrants had arrived this morning: Many Stonechats and Wheatears, four Yellow and several Pied Wagtails, a number of Meadow-Pipits, four Common Whitethroats, a few Common and several Lesser Terns; a few Swifts were also seen. An immature female Ringed Plover was brought to me, having been taken in the vicinity of Smith's Knoll Lightship by one of our fishing boats on the 21st.

23rd.—Vast numbers of Swallows (mostly immature) and Martins were observed flying over the Denes in the evening; a few Swifts were also seen. Pied Flycatcher seen.

24th.—Four Common and a few Lesser Terns, fewer Stonechats and Wheatears, more Yellow and Pied Wagtails. Many Dunlins were heard passing over at night.

25th.—A Whinchat, one or two Willow-Wrens, a few Pied Wagtails, and two Lesser and a few Common Whitethroats had arrived. Still a few Wheatears and Stonechats to be seen. Sand-Martins and Swallows, and a few Common and Lesser Terns were noted going south. A great many Whimbrel were heard about the lighthouse at night, but none could be seen.

26th.—Three Yellow and several Pied Wagtails, a Lesser and two Common Whitethroats, and a few Wheatears and Pipits seen; also a Curlew and two Common Terns. With the addition of a Reed-Warbler, about the same number of birds were seen on the 27th.

29th.—At Benacre, nine Curlews were resting on the Denes, where there were also many Wheatears, one or two Whinchats, a few Stonechats, and a number of Yellow and Pied Wagtails. Two Dunlins and six Whimbrel were noted going south along the shore.

30th.—A fair increase of Wagtails and Pipits was noted; Wheatears and Whitethroats were seen in about the same numbers. Many Swallows and Martins were observed going south.

September 1st.—Quite a number of Wheatears and Stonechats had put in an appearance; two Whinchats and a Wryneck were also seen. The numbers of Wagtails and Pipits had decreased.

2nd.—Wheatears and Stonechats were seen in smaller numbers; a few small lots of Yellow Wagtails were observed to come in from the north.

6th.—Many Wheatears had arrived; Stonechats and Pied Wagtails were observed in fair numbers; only one Yellow Wagtail was seen.

10th.—A few small flocks of Linnets had arrived; only one or two Wagtails seen; several Swallows and Martins were noted making southwards; about the same numbers of Stonechats and Wheatears were observed.

12th.—A Heron was seen making out to sea eastwards, and a Kestrel was noted going south along the shore. Sky-Larks, Starlings, and Linnets were sprinkled over the Denes in small flocks; other birds observed were a few Meadow-Pipits and Pied Wagtails, Wheatears, and Greenfinches. Two Swifts were seen on the 14th.

17th.—A vast number of House-Martins, with a few Swallows, were observed making southwards; many of both species were also seen collected on telegraph wires. A few Wheatears and a Lesser Whitethroat were seen. Meadow-Pipits and Linnets were noted in fair numbers; and a few Common Terns, Stonechats, and Yellow Buntings were also seen.

19th.—Two Reed-Buntings, several Sky-Larks and Starlings were noted as fresh arrivals; a considerable increase was also noted in the number of Hedge-Sparrows. Swallows and House-Martins were seen in large numbers, and many Common Terns were noted along the shore and also at the harbour-mouth.

21st.—Several more Reed-Buntings had put in an appearance; a few Meadow-Pipits, Linnets, Sky-Larks, and Stonechats were seen, also two Wheatears, several Swallows and House-Martins, and a Marsh-Tit. A few Lesser Black-backed Gulls were noted resting on the Denes. A large flock of Starlings were seen flying south, and a Dunlin was noted going north.

23rd.—Many flocks of House-Sparrows, a few small lots of Meadow-Pipits, four flocks of Starlings, and a few Linnets were observed passing along southwards. House-Sparrows, Larks, and a few Linnets were also noted going north. A few Reed-Buntings, several Goldcrests, and two Cole Tits were also seen.

24th.—Five Kestrels were seen on the "marrams" together. Two flocks of Starlings, a flock of House-Sparrows, and a few odd lots of Linnets noted going north. A number of Yellow Buntings had put in an appearance; other birds observed were a few Reed-Buntings, a Turtle-Dove, a Common Whitethroat, and several Goldcrests and Pied Wagtails.

28th.—The southward movement comprised the following species: Several lots of Linnets, Starlings, a flock of Tree-Sparrows, and several House-Sparrows. Going north were a number of Greenfinches and Linnets. A fair number of Reed-Buntings, Starlings, a few Pied Wagtails and Larks on the Denes. Many House-Sparrows and a few Swallows were also seen.

30th.—Greenfinches, Linnets, Tree-Sparrows, and Larks were moving southwards; several House-Sparrows were heard among the migrating flocks of Linnets. A Ring-Ousel was seen on the Denes.

October 1st.—Moving south were numbers Linnets, a few small lots of Greenfinches, a flock of Larks, odd lots of Meadow-Pipits, and a few flocks of Tree and House-Sparrows; while going north were noted a flock of Starlings and one or two flocks of Linnets and Greenfinches. A Greenland Wheatear was observed, also a few Pied Wagtails, several Goldcrests, Cole Tits, and a number of Reed-Buntings. Two Sand-Martins were noted going south.

2nd.—Four flocks of Mistle-Thrushes observed going north; one flock contained fifteen birds. Other species noted passing northwards were several lots of Linnets and a few Greenfinches. Linnets, Greenfinches, Tree and House-Sparrows were all seen going south. Still a few Reed-Buntings; several Swallows and House-Martins seen.

I was away from the town from this date until the 11th.

11th.—Three large flocks of Rooks were seen to arrive in from over the sea, flying very high. Passing south were noted a few flocks of Chaffinches and Linnets; many Gulls of various species were also working southwards. Many Goldcrests were seen, also three Rock-Pipits.

12th.—A great increase in the number of Goldcrests and Common Wrens was noticed. A Brambling was heard going south with a flock of Linnets; Chaffinches and Greenfinches were also going south, while going north were Tree-Sparrows, Greenfinches and Linnets.

14th.—A fair migration of Mistle-Thrushes was observed; several flocks were passing both north and south. Other birds passing in a southerly direction were a flock of Starlings, five Hooded Crows, two Swallows, two Bullfinches, two Bramblings, many Linnets, a few flocks of Tree-Sparrows, a few Greenfinches and Chaffinches, and a few odd lots of Larks. A small flock of Larks and another of Starlings arrived in from sea. The northward movement consisted of a few Linnets and Starlings. Still several Goldcrests.

16th.—I was working the tide-mark with the hope of finding a few birds washed ashore during the rough easterly wind that prevailed at the time, when I came across a Razorbill with its breast black, sitting by the edge of the water vigorously preening its feathers; I ran and endeavoured to capture it before it could take to the water, but it was too smart for me, as with harsh croaks it shuffled back into the sea, and by repeatedly diving soon placed a fair stretch of water between itself and the shore. I was for a time greatly puzzled about this bird, and wondered in my own mind whether I had made the acquaintance of a variety of Razorbill hitherto unrecorded, but the entry of the 17th will explain. A Jackdaw was the only bird washed ashore. A great arrival of Robins was noted, and fights between the resident birds and the newcomers were general; I could not detect the Continental form among these Redbreasts. Flocks of Linnets, Greenfinches and Chaffinches were passing both north and south; some Goldfinches were heard among the flocks of Linnets that were going south.

17th.—I walked from Corton almost to Gorleston by the beach in company with Mr. Hunt. The tide-mark was strewn with a thick tar-like substance, and we found in all eight Razorbills and a Guillemot cast up from the sea, so besmeared with this black viscous matter that not one feather could be separated from another, and in only one example could any trace of the white breast be seen. We also saw another live example sitting on the shore, madly endeavouring to free itself from the sticky mess. Mr. A. H. Patterson, writing in the 'Eastern Daily Press' on this subject, says:—"I suspect some unfortunate submarine or torpedo-destroyer had been sunk, and the petrol and other stuff of a like character had, after explosion, risen to the surface." I imagine this is a most satisfactory explanation as to the presence of this "tar" that had caused such mortality among the diving birds. The following birds were found cast up along the shore, none of which I might state had any trace of the tar-like matter on their feathers: two Fulmar Petrels, two Rooks, a Jackdaw, two Redwings, a Song-Thrush, two Starlings, and a Herring-Gull, and a Lesser Black-back.

20th.—The coastal migration was very slight, only a flock of Starlings were seen going north, and a few Linnets moving south. I disturbed a flock of about a dozen Blackbirds, mostly young males, from a patch of burnt furze*; they had evidently arrived quite recently. Fair numbers of Robins and Goldcrests are still to be seen; among the Robins I was able to identify at least three of the lighter Continental form; these birds are extremely shy, and skulk in the same manner as do the Blue-throated Warblers. Mr. Patterson, writing from Yarmouth under this date, remarks:—"What a 'body' of Redbreasts must have arrived last night (19th); our little park swarms with the little light red fellows. I picked one up dead near telegraph wires close to the beach, and gave it to my Kestrels with a dead hen Blackbird."

21st.—During a short walk along the beach near the harbour I saw six more "tarry" Razorbills and a Guillemot; a Redwing, and the wings and clean-picked sternum of a Rook were also seen on the tide-mark. Redwings are to be heard passing over the town almost every night.

22nd.—Several flocks of Larks, a large flock of Starlings, and a few Linnets and Chaffinches were noted going south. A great muster of Rooks, Jackdaws and Hooded Crows were to be seen in the coastal meadows. A Hooded Crow was seen attempting to bully a Kestrel; the Crow was very much in earnest, but the Hawk merely glided aside at each stroke, and appeared to take things very calmly. One or two Continental Robins were observed. The following other birds were seen in fair numbers:—Blackbirds, Robins, Song-Thrushes, Yellow Buntings, Tree-Sparrows and Goldcrests; a few Great and Blue Tits were also seen.

23rd.—Six Shore-Larks had put in an appearance on the Denes. A movement of Larks and Starlings of considerable dimensions took place; the Larks were skimming along but a few inches from the ground, and the Starlings were flying very slowly, as the wind was very strong from the south; both species were travelling in a southerly direction. A large number of Linnets, a flock of Greenfinches, and a few small lots of Chaffinches were noted going south, as were also a considerable number of Greater Black-blacked, Herring and Black-headed

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* Mr. Patterson has noticed dead and half-roasted *Nemoralis* Snails and dried Lizards among the blackened stumps and ashes of burnt furze: probably these molluscs had attracted the birds.

Gulls. Robins and Blackbirds had decreased in numbers. I watched two Finches, of a species I was unable to determine, fly direct out to sea until out of range of my glasses. Still a number of Rooks, Hooded Crows and Starlings in the meadows; a large number of Yellow Buntings and a Wheatear seen.

24th.—A large southward movement of House-Sparrows was observed just at daybreak; many Gulls were also moving south. A Greenland Wheatear and two Rock-Pipits seen. Five tarry Razorbills and two Guillemots were found on the beach at Pakefield.

25th.—The following species were observed travelling southwards:—Numbers of Linnets, Greenfinches, a few Chaffinches and Tree-Sparrows, a few Larks and Starlings, a flock of Song-Thrushes and a flock of Lapwings, three Bramblings, and a few Meadow-Pipits. A small company of Rooks and a flock of Larks arrived in from sea. Linnets, Starlings and Song-Thrushes were noted going north. Several Reed and Yellow Buntings on Denes. A Chiffchaff was seen and heard singing.

28th.—Six Shore-Larks were seen. A Heron was observed making southwards. Several large flocks of Rooks, Jackdaws and Hooded Crows were coasting south, as were also Yellow Buntings, many Tree-Sparrows, a few Meadow-Pipits, many Linnets, and a few Greenfinches and Sky-Larks.

November 1st.—Six more Shore-Larks and three Snow-Buntings were noted as fresh arrivals. Several Lesser Black-backed and many other Gulls seen. An immature Herring-Gull was seen flying over the town with a long piece of string hanging from its mandibles; this bird may have been the victim of one of the foul jokes often perpetrated by the idlers that frequent the fish wharf, one of which is that of casting into the harbour a piece of string to each end of which is fastened fish offal; it invariably happens that two hungry Gulls will seize and swallow the connected baits at once, and fly off with the string holding them together.

On the nights of the 2nd and 3rd Lapwings and Redwings were heard passing over the town.

6th.—A considerable southward movement was witnessed, and the flocks comprised the following species:—Rooks, Hooded Crows, Yellow Buntings, Meadow-Pipits, Sky-Larks, Starlings, Linnets, Greenfinches, Chaffinches, Tree-Sparrows and Mistle-Thrushes. On the Denes were noted a Shore-Lark, three Snow-Buntings, a Rock-Pipit, Lesser Black-backed and many other Gulls, a flock of Yellow Buntings, and several Goldcrests.

7th.—At Benacre. On the marshes were a number of Wigeon, a few Teal, several Common Snipe, many Lapwings, a Heron, and a Short-eared Owl; in a thick reed-bed were seen three Bearded Tits and a number of Reed-Buntings. On the Denes was a vast concourse of Rooks and Jackdaws (we estimated their numbers as over a thousand) which, as darkness came on, flew to the trees by the edge of the broad to roost; this appears to be a general roosting-place in autumn for the Rooks and Jackdaws of the district, for, as we watched, large flocks were continually arriving from all quarters, and the chattering as new flocks arrived was almost deafening. Mr. Hunt informs me that he has witnessed this mustering of Corvines at this spot often before.

11th.—A big movement of Greenfinches, Linnets and Chaffinches to the south was noted; a few Starlings also going south. A flock of about a dozen Shore-Larks was seen on the south Denes.

A Purple Sandpiper was seen on the 13th.

18th.—A flock of Rooks and Jackdaws was seen to arrive in from sea. Curlews and a number of other waders were heard passing over the town at night; Lapwings and Redwings have been heard passing over on several nights lately.

21st.—Six Shore-Larks and a flock of about twenty Snow-Buntings were observed on the Denes.

December 20th.—A Lesser Spotted Woodpecker was seen in a lane at Gunton. This is the first time this species has come under my notice in this district, although Mr. Hunt has on one or two occasions observed it at Pakefield. A large flock of Wood-Pigeons was seen passing south.

SOME EXPERIMENTS ON COLOUR-CHANGE IN THE TENCH.

By H. N. Milligan, F.Z.S.

It is well known that the colour of the Common Tench (*Tinca vulgaris*) adapts itself to the surroundings in which the animal lives,* but a short account of seven experiments on colour-changes in this fish may perhaps be of interest. The first two experiments were involuntary ones.

1. Two healthy female Tench, each of about six inches in length, had been living in an aquarium, the floor of which was covered with dark brown pebbles and the back with dark brown rocks. The fishes were of a dark bronze-green colour, with their fins tinged with green and their irises of a deep coppery red; and this colouration had not varied, so far as I could see, or at all events had varied little, during the whole of the time (more than two months) they had been in the aquarium. At 11 a.m. on February 26th, however, they were removed to a second aquarium, which was in a somewhat lighter place opposite to a window, containing whitish pebbles and with a back of newly-made rockwork in great part composed of white cement, against which the dark green bodies of the fishes stood out conspicuously. At 9.30 a.m. on the next day my attention was drawn by another person to the fact that the fishes had undergone a striking change of colour. Their bodies were now of a pale yellowish colour, with only a very faint tinge of green, which gave them a sickly appearance, their fins being almost colourless and their irises orange. The change had certainly brought their colour more into harmony with the general colour of their background of pebble and rockwork. The aquarium was a comparatively small one, measuring two and a half feet in length and one and a half feet from back to front, and the two fishes could therefore

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* See, for example, 'A History of Scandinavian Fishes,' Part 2, p. 750, of Fries, Erkström & Sundevall, second edition of Smitt.

be detected without difficulty; but it seems quite probable that if they had been in a larger aquarium they might have been entirely overlooked in a cursory glance. It would have been interesting to observe whether the fishes would have changed to their original colour if they had been taken from aquarium 2 and put into aquarium 1, but unfortunately this aquarium had been cleaned out and the pebbles removed in the meantime.

2. In aquarium 2 the fishes remained until April 6th, *i. e.* for five and a half weeks. During this time the whitish pebbles and rocks of this aquarium had become somewhat darker in colour owing to the effects of light and the growth of green and brownish vegetable matter. I believe, though it is very difficult to be quite certain in such a case, that the fishes also had become a little darker in colour, their green tinge being more pronounced.

3. I now resolved to observe the effects of placing the fishes in a third aquarium whose bottom and three sides were of dark blue slate, the top of the aquarium being almost wholly covered with a wooden board to exclude light, and the glass front turned away from the window. In aquarium 3 the two fishes were placed at 10.10 a.m. on April 6th. At 10.50 I looked at them and saw at once that they were unmistakably darker in colour. At 12.5 I examined them again, removing them rapidly from the dark aquarium 3 to a small glass tank and carrying them to the window in order to do so. Both fishes were now dark green, perhaps of a darker green than they had been when I took them from aquarium 1, their irises being coppery red and their fins greenish, but the beautiful bronze tint of the body was now almost absent.

4. I allowed the two Tench to remain in aquarium 3 until the morning of the 8th. At 12.35 I removed one of them to a white enamelled dish, containing about a gallon of water, placed before a window in a fairly light spot. A distinct change could be observed in this fish at 1.30, and by 2.30 the change back to the sickly pale yellow colour had been accomplished. The individual left in the dark aquarium 3 was, of course, unaltered. When, at about 4.15, the two fishes were put together in the little glass tank and carried to the window, the contrast between the dark green individual and the pale yellow one was very striking.

5. Both fishes were now put back into the dark aquarium 3, and on the following morning (April 9th) both were of the deep green colour.

I thought that the above-described experiments deserved to be recorded because, though not perhaps of an original nature, and relating to only two individuals, they were of themselves sufficiently definite to allow of certain conclusions being drawn, and might therefore be acceptable as additional evidence that the Tench can, to a certain extent, adapt its colouration to its surroundings, and that it can be made to change at will.

6. In 'A History of Scandinavian Fishes,' p. 750, it is remarked of the Tench that in clear water ". . . . . . the whole body is yellowish green on a golden ground, with fine, golden dots, at the tip of each scale . . . . . . When it is found in the forest tarns, where the water is generally very dark, the entire upper part of the body is black, as though dipped in ink, only the belly being somewhat lighter." As the Tench in aquarium 3, although dark green, and darker on the top of the head and along the middle line of the back than on the under parts, were certainly never so dark "as though dipped in ink," I covered up the aquarium 3, with the two Tench in it, in such a way that all light was excluded, and left it for a day. The Tench seemed to me at the end of this time to be no darker than they had been at any time in aquarium 3. Experiments on these two Tench seem to show that there is a lightness of yellow and a darkness of green which the fishes cannot exceed, and that two hours is sufficient time to enable them to change from one extreme to the other.

7. I wished now to observe whether any effects would be produced by taking a Tench from aquarium 3 and putting it into a small aquarium, which had four sides of glass, and then surrounding the aquarium with bright red cloth, through which, for a day, a strong light passed from a window. The Tench did not change from its dark green colour.

THE RELATION OF THE OYSTERCATCHER TO ITS NATURAL ENVIRONMENT.

By J. M. Dewar, M.D.

(Continued from p. 291.)

IV.—The Summer Environment.

1. *General Considerations.*—The area which came under observation as a nesting habitat consisted of Loch Tummel; that portion of the valley of the River Tummel extending from Faskally to the junction of Tummel and Tay at Ballinluig; the Vale of Atholl between the villages of Blair and Killiecrankie; and the lower part of Glen Fender. Only the south shore and the foot of Loch Tummel were systematically observed.

The rocks of the area belong to the metamorphic series, and consist mainly of sedimentary limestones and schists, together with numerous igneous sills scattered all through the various schists.

The area forms part of a "land of ridges and broad valleys," the weather conditions being of the Atlantic type. From Loch Tummel to the junction of the Tummel and the Garry, the gradient is steep, and there are hardly any deposits of alluvium. At the junction is a series of terraces, covered with gravel and cut out of a thick deposit of boulder clay. Similar conditions prevail as far as Pitlochry. From this point to Ballinluig the gradient is slight, and the river has denuded the bottom of the ancient glacial lake, forming a large plain of alluvium. Between Blair and Killiecrankie the slope is considerable, but less than in higher parts of the Garry. Here large alluvial terraces have been formed. The hill-streams are mostly torrential in character, and deposit little alluvium. The lower portion of Strath Tummel is well wooded, while natural birch is general up to about 300 metres. The distribution of the human population is determined by the boulder clay deposits which favour arable cultivation, and maintain a larger number of persons. Between Blair and Killiecrankie the drifts are a mixture of moraines and boulder clay. This area is occupied by numerous farms. On the north side of Loch Tummel there is an important deposit of boulder clay, which is largely farmed. The left bank of the Tummel below Faskally has large deposits of boulder clay, and is the chief area of arable cultivation in the valley. The alluvial plains of the Tummel lie more as pasture than under cultivation. Elsewhere there is a cold inferior soil suitable only for sheep pasture.

The meteorological data available come from Ochtertyre, Central Perthshire (90 metres above M. S. L.). The mean annual temperature is 8·16° ± 4·06° C.; the average rainfall for the year being 1·05 metres on 192 days (1871–1905). The mean monthly temperature and rainfall for April, May, and June are here given in the form of a table for Leith (sea-beach habitat) and Ochtertyre (*quasi* river valley habitat), for the sake of comparison.

Table 1, showing Average Monthly Temperature and Rainfall for April, May, and June at Leith and Ochtertyre (1871–1905).

TEMPERATURE.	APRIL.	MAY.	JUNE.
Ochtertyre...	7·13° ± 4·56°	10·05° ± 5·11°	13·44° ± 5·11°
Leith	7·31° ± 4·16°	10·05° ± 4·28°	13·28° ± 4·34°
RAINFALL.			
Ochtertyre...	0·058 m.	0·060 m.	0·076 m.
Leith	0·036 m.	0·042 m.	0·049 m.

The breeding stations within the area examined fall into three distinct habitats—a hill-stream, a river valley, and a lake beach habitat. The Fender Burn is representative of the first, the Rivers Garry and Tummel of the second, and Loch Tummel of the third. A strong similarity exists among all the stations of each habitat, variability of the factors being much less pronounced than in the winter environment.

2. *Hill-stream Habitat.*—A general survey of the whole area made in 1909 showed that Oystercatchers do not nest along the

hill-streams in this locality. The occupation of Glen Fender appears to be due to a circumstance not forming an integral part of the environment of a hill-stream. The breeding territories extend along the glen for a distance of two kilometres from the top of the terminal gorge at 230 metres up to the 305 metres contour line. Within this course the stream is of small size and flows with a moderate gradient. Areas of shingle are few in number, and possibly too small to be serviceable for nesting purposes. The south bank, lying between the stream and the public road, has an average breadth of 450 metres, and lies mostly below the 305 metres line. It is a terrace, a steep slope joining the upper and lower levels. More than twelve years ago the south bank was densely wooded. The trees were felled, and the roots left in the ground to bleach. As grass grew, sheep were turned down. The conditions have remained unaltered to the present time. The ground is permanently wet in places. There is a moderate supply of Earthworms, and a fairly abundant supply of tipulid and coleopterous larvæ. The northern slopes of the glen have a thick deposit of boulder clay, and are cultivated below the 305 metres level. The arable land forms the general or distant feeding-ground, and provides a large part of the Earthworms required to feed the young. The rest of the glen is under heather and grass. Three pairs are cantoned along the south bank, which forms the local feeding-ground. The nesting-sites have not been seen. The tree-stumps are used as watchtowers, and for the sunning reaction. The roots, now of a light grey colour, form an important element in the crouching response of the chicks. The terraced nature of the ground is used successfully by both young and old in evading detection. The area is little disturbed.

3. *Lake-beach Habitat.*—Loch Tummel is a deep rock basin, 4·4 kilometres long. The shore descends steeply into the water, and is marked by a narrow fringe of angular boulders, resting on the mud substratum. At the east end, or foot, of the loch there is a storm-beach of light grey shingle, grading northwards into a fine sand-beach, and running upwards into the true lake margin of angular boulders. The storm-beach has a breadth of about 45 metres. A strip of uneven grass-grown ground, with a few trees, separates the beach from an alluvial plain which is

under cultivation. On the south shore of the loch, the Lochan a Chait, Frenich, and Cragan Dubh Burns have deposited cones of alluvium, in that order from east to west. The cones are margined by light grey shingle on the east and north aspects. Towards the west the shingle thins out into a scanty fine gravel, resting on the mud substratum. The shingle rarely exceeds 25 metres in breadth, and mostly is much narrower. The eastern cone forms an old enclosed pasture, and shows very well terracing into two levels. The large Frenich cone is under arable cultivation, which, however, leaves a broad strip of turf thinly planted with trees along its water margin. The western cone is very small, and consists entirely of natural turf, thinly sown with alders. Small sand-beaches are intercalated in the shingle at places. The water is fairly deep on the east side of the cones, shallow on the west, where mud-banks are forming which expose at low water, and become then, like the mud shore, more or less grass-grown. The true lake margin is not evident on the beaches of the cones. The hillside behind the southern shore shows heather and rock grading into natural birch and alder wood towards the west. The north bank of the loch is largely under arable cultivation. Within the area examined, nesting is confined to the storm-beach and the beaches of the alluvial cones. The ground behind the storm-beach and the turfed portions of the alluvial cones form the local feeding-grounds. The arable land at Frenich, Duntanlich, and on the north side of the loch form the general or distant feeding-grounds. From these, large quantities of Earthworms are brought to the young. The local feeding-grounds provide tipulid and coleopterous larvæ in plenty. The true lake margin has a large invertebrate population, but the beaches of the alluvial cones are deficient in this respect. The open spaces in the woods also contribute supplies. The whole of the breeding territories and local feeding-grounds lie considerably below the 152 metres contour line. A large sand-bank at the head of the loch, and a boulder area on the north shore, near the exit of the loch, are used every year by the birds that have failed to breed as places of assembly for bathing, sunning, and other activities.

4. *River-valley Habitat.*—A. *The River Garry.* The river in the four kilometres of its course between Blair and Killiecrankie

falls about 15 metres from an elevation of about 120 metres at the former place, and describes two major curves bordering extensive alluvial plains. The beds of shingle are fairly large, and composed of a light grey, water-worn stone of moderate size. The Strath is well farmed and populous. The river side is easy of access to the public. The resident stock has been much harassed and rarely succeeds in breeding on the shingle. The birds have taken to nesting away from the river on naked moraines, other collections of stones, and, in at least one instance, on the ballast of the railway track.* All the breeding territories and local feeding-grounds lie below the 152 metres contour line.

B. *The River Tummel.* Between Faskally and Ballinluig the Tummel is a pool, rapids river of considerable size. Above Pitlochry it flows through a narrow glen, ending in a rocky gorge. At Faskally there are broad river terraces, fringed by a bank of shingle, composed of light grey stones of moderate size, and rising at least one metre above summer water-level. The Faskally terraces show two main levels, an upper and a lower, and are in pasture. At Clunie there is a crescentic band of shingle backed by a steep wooded slope. From Pitlochry to Ballinluig the gradient is gentle (about 1 in 400), and the river has formed "a large flat of alluvium." The plain has been cut by the river into cones. These are fringed with light grey shingle, which spreads out into larger areas, or banks below the cones, the size of the areas increasing from above downwards, and culminating in the relatively vast area of shingle running alongside Logierait Wood, on the right bank of the river. The cones are entirely in pasture, or the basal portions are cultivated. The hill slopes on the left bank, being covered largely with boulder clay and having a south-western exposure, are mainly under cultivation. The slopes on the right bank are little farmed, being mostly in natural grass, or, as in the lower reaches, densely planted with wood.

Nine stations in all were recognized and kept under observation between Faskally and Ballinluig. They have not, however, an equal value for population, the numbers varying from one pair to ten or more pairs in each station. Denoted by the nearest place-name on the map, they are, from above downwards, Faskally, Clunie, Pitlochry, Black Spout, Dunavourd, Haugh, Moulinearn, Logierait Wood, and Ballinluig. (Ballinluig Island is here included in the Logierait station.)

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* This happened above Blair.

Faskally has already been described. It is quite a typically favourable river station, having a fairly large and high shingle-bed, well secured from intrusion; a terraced local feeding-ground in pasture; and general or distant feeding-grounds which, however, are rather far away. The Clunie area is much disturbed, and is backed directly by a steep, wooded bank. No young birds have been seen here. The Pitlochry station is the first of the large areas, the extensive and high bank of shingle being centred by a small grassy island with a few pine trees. The cone is beautifully terraced, and is in pasture. It now forms a public park. No birds breed here. The Black Spout and Dunavourd areas are similar to Faskally in all respects, except that general feeding-grounds are not far away. Dunavourd ceased to be occupied when the pasture of the local feeding-ground was ploughed. The Haugh station, though very large, has a simple composition. There is an extensive and high bank of shingle containing a grassy island. The alluvial flat has considerable extent, is obscurely terraced. Most of it is pasture, but portions farthest from the river are under cultivation. The area is much disturbed by the human population. Moulinearn and Logierait are large stations with diverse features. A more intensive examination will probably break them up into several distinctive areas. The upper part of the Moulinearn margin is composed of large stones having more an appearance of moraine than of river shingle. It grades into a belt of true shingle, which spreads out into a large area of shingle below the alluvial cone. The latter is mainly in pasture, distinctly terraced, and marked with clumps of whins, shallow irregular mud-pits and sand-bunkers. The basal part is cultivated, and there is a backwater with wide, muddy margins. The Logierait area measures over 1600 metres in length by 400 metres in breadth. The upper part is a terraced alluvial cone in pasture with a shingle fringe of considerable size. At the extreme north-western corner, what appears to be morainic material, similar to that found at

Moulinearn, is occupied by a small settlement. Below the alluvial cone the shingle forms a broad belt, backed by the steep wooded slope of Logierait, and margined by three wooded islands. These islands form local feeding-grounds. The uppermost is a dense, natural wood, with wet sand-gullies and pot-holes gouged out of the substratum by the winter floods. The lower islands are flat, grass-grown and artificially wooded. The Ballinluig area presents a sequence of appearances very similar to that of Moulinearn. It also contains a plateau planted with pines and having a turf layer on a clay substratum. This station is of moderate size, and is subject to considerable disturbance.

The whole of the breeding territories and local feeding-grounds lie between 60 and 105 metres above sea-level. The 76 metres contour line crosses the river at the upper part of the Haugh area.

Nesting is mostly confined to the shingle. At Moulinearn and Ballinluig, however, more nests are seen on mud and turf, due in the former place probably to carting of stones, and in the latter to other human interference. Nesting far from the river is rare. One instance came under notice. Towards the end of June a chick, a few days old, was seen on the hillside above Dunfallandy House. The chick must have belonged to a second, or possibly a third, laying.

The shingle shows few living invertebrate forms. At the time of the hatch, and possibly at other times, large quantities of Stonefly nymphs are to be found under stones at the water margin. These nymphs are fed extensively to the young during the early days. The local feeding-grounds, where in pasture and open to examination, are rich in tipulid and coleopterous larvæ. The bulk of the worms comes from the arable land. Only the upper Logierait wooded island was examined. The substratum is sandy. Where the sand was dry, the nature of the food supply observed to be got by the birds could not be determined. The wet sand of the gullies and pot-holes contained an abundance of worms of sand and silt bottom formation.

(To be continued.)

A CATALOGUE OF THE LAND AND FRESHWATER MOLLUSCA OF SUSSEX.

By E. W. Swanton.
(Member of the Conchological Society; Curator of the Educational Museum, Haslemere.)

(Continued from p. 314.)

Helix aspersa, Müller.—Generally distributed. Mr. J. W. Lewis Abbott's discovery of a number of very large shells (represented both by whole and broken ones) under about three feet of midden material in primeval refuse-heaps at Hastings affords presumptive evidence that it was an article of food in prehistoric times. Mr. J. P. Johnson has recorded it from a neolithic rain-wash at Brighton. Mr. R. Miller Christy found, in 1878, "assuredly pre-Roman specimens in association with *Clausilia rolphii*, *Cyclostoma elegans*, and *Helix nemoralis*, buried beneath the loose earth, filling up the pits within the Roman Camp at Cissbury." Mr. Ernest Robinson found (1907) hundreds of shells between the large flints in some of the prehistoric pits in the neighbourhood of Saddlescombe. He came to the conclusion that they reached those positions when hybernating. Mr. J. W. L. Abbott found albino specimens with shells of normal coloration (a rare condition) in St. Margaret's Road, St. Leonards-on-Sea. Small forms have been taken by Mr. C. H. Morris at Lewes, by Mr. R. M. Christy at Brighton, and by Mr. B. M. Oakshott at Worthing.

Var. *conoidea*, Picard.—Near Lewes (Jenner); Downs, Eastbourne (Rev. S. S. Pearce); tolerably common on a stone wall facing the sea at Littlehampton (W. C. Atkinson); Worthing (J. H. James).

Var. *globosa*, Picard.—Near Lewes (J. Jenner).

Var. *unicolor*, Moquin-Tandon.—Worthing (B. M. Oakshott); Lancing (F. Rhodes).

The subvar. *grisea* has been observed by Mr. E. F. Becher at Clayton.

Var. *fasciata*, Picard.—Lancing (F. Rhodes); with B. F. 12300 at West Stoke (Rev. W. A. Shaw).

Var. *solidissima*, Paulucci.—" A dull-coloured and extremely thick-shelled variety living on the South Downs in rabbit burrows, R. M. Christy " (Taylor, 'Monograph,' iii. 257).

Var. *albofasciata*, Jeffreys.—Worthing (A. Loydell); Littlehampton (D. Taylor); Lancing and Sompting (E. W. S.).

The subvar. *albescens* has been taken at Littlehampton by the Rev. D. McMurtrie; and the subvar. *puncticulata* at Winchelsea (Rufford Collection, Hastings Museum).

Var. *exalbida*, Menke.—Lewes (Morris and Unwin); near the mouth of the Cuckmere (Jenner); under a wall near Meads, Eastbourne (Rev. S. S. Pearce); Seaford, also a colony at Newhaven (Jenner); St. Leonards-on-Sea (J. W. L. Abbott); with var. *conoidea* at Littlehampton (W. C. Atkinson); Sompting (R. M. Christy); Worthing (B. M. Oakshott); Heyshott, hedges near the Down (E. W. S.).

The subvar. *virescens* was found by Mr. Borrer at Cowfold.

Var. *zonata*, Moquin-Tandon.—Near Lewes (J. H. A. Jenner and R. D. Darbishire); Worthing (B. M. Oakshott); Wilmington, near Eastbourne (W. E. Brady).

Var. *tenuior*, Shuttleworth.—Worthing (A. Loydell).

Var. *undulata*, Moquin-Tandon. — Near Lewes (Jenner); Worthing (T. D. A. Cockerell); Littlehampton (Rev. D. McMurtrie); Winchelsea (Rufford Collection, Hastings Museum).

Var. *flammea*, Picard.—Near Lewes (Jenner); Winchelsea (Rufford Collection).

Monst. *sinistra*, Férussac.—" Two dead but immature examples found laid together in a garden at Lewes, May, 1897, C. H. Morris " (Taylor, 'Monograph,' iii. 267). " A sportsman once asked me if *H. aspersa* turned the wrong way was unusual, as he had seen two by some burrows whilst rabbit shooting near our West Surrey border! " (Rev. W. A. Shaw, *in litt.*, November, 1911).

Monst. *cornucopiæ*, Gmelin.—The Rev. W. A. Shaw reports a subscalariform example from Little Common, Bexhill.

H. pomatia, Linné.—Christopher Merret refers to the occurrence of this species in Sussex in his 'Pinax rerum naturalium Britannicarum,' 1667; the reference is the earliest that I have discovered concerning the molluscan fauna of the county. We have evidence that it was esteemed as an article of diet by the primeval inhabitants of the Downs; the Rev. W. A. Shaw informs me that shells were found in British middens on Stoke Clump in 1910.

It is doubtful whether it exists in Sussex at the present time. Allusion has already been made to attempts at reintroduction by zealous conchologists (pp. 178, 179).

H. nemoralis, Linné.—Generally distributed. Mr. F. Dixon has recorded it from post-Pliocene beds at Bracklesham Bay, the Rev. W. A. Shaw from a post-Pliocene deposit near West Stoke, and Mr. J. P. Johnson has found it in Pleistocene beds exposed at low tide on the foreshore at West Wittering. Holocene records are the "mud deposit" at Selsey, 1891, Alfred Bell; beneath loose earth filling up the pits in the ancient Roman camp at Cissbury, Mount Caburn, and Seaford (General Pitt Rivers); cultivation balks on the Downs near Brighton (H. Toms); and near the base of a neolithic chalky rain-wash overlying the Palæolithic rubble-drift to the east of Brighton (J. P. Johnson). (Its association with archæological remains has been commented upon in the first part of this paper, pp. 179–181.)

Large shells (var. *major*) have been taken by Messrs. Jenner and Morris at Lewes, and minor forms have been taken in the same neighbourhood by the former observer.

Var. *acuminata*, Baudon (= var. *conoidea* Clessin).—Common on Brighton Downs (Rev. J. W. Horsley); Lewes (J. H. A. Jenner).

Var. *rubella*, Moquin-Tandon. — Lewes (T. S. Hillman); Pevensey (T. D. A. Cockerell); between Robertsbridge and Hurst Green (T. D. A. Cockerell); Littlehampton (D. Taylor); Graffham, near Petworth (D. Taylor); Charlton Forest (E. W. S.); about Sompting and Lancing (E. W. S.).

Var. *libellula*, Risso.—Lewes (T. S. Hillman and J. H. A. Jenner); Littlehampton and Burpham (D. Taylor); Buckhurst Park (E. W. S.); Ore, Hastings (A. J. Alletsee).

Subvar. *flava*.—Charlton Forest (E. W. S.).

Var. *albina*, Moquin-Tandon.—Lewes (C. H. Morris).

Var. *castanea*, Moquin-Tandon.—Lewes (J. H. A. Jenner); Littlehampton and Northchapel (D. Taylor).

The fawn-coloured subvar. *petiveria* and the subvar. *fulvocincta* (described as "very pale fulvous or pinkish yellow") have been found near Lewes by Mr. C. H. Morris.

Var. *fasciata*, Moquin-Tandon. — Heyshott and Graffham (D. Taylor).

Var. *hyalozonata*, Taylor.—Lewes (J. H. A. Jenner); Charlton Forest (D. Taylor).

Var. *roseolabiata*, Kobelt.—Near Lewes (J. H. A. Jenner).

Var. *albilabris*, Dumont & Mortillet (= *albolabiata*, von Mart.). Ranscombe, Lewes (T. S. Hillman); Ratham (W. Jeffery); Lavant (Rev. W. A. Shaw).

Var. *bimarginata*, Moquin-Tandon.—Lewes (Jenner).

Var. *undulata*, Gentiluomo.—A form approaching this variety has been taken by Mr. Douglas Taylor in Charlton Forest.

Var. *fascialba*, Picard (= *leucozona*, Taylor).—Lewes (C. H. Morris); Charlton Forest (D. Taylor).

Var. *conica*, Pascal.—On the Race Hill, Lewes (Jenner); common on Brighton Downs (Rev. J. W. Horsley).

Var. *studeria*, Moquin-Tandon.

The subvar. *purpureo-tincta*, "very pale purplish like var. *pallida* of *H. hortensis*," has been found near Lewes by Mr. C. H. Morris (Cockerell, 'British Naturalist,' 1891, p. 65).

Var. *olivacea*, Risso.—Near Lavant (Rev. W. A. Shaw).

The subvar. *hepatica*, Cockerell.—"Liver colour, suture and part of spire whitish, near to f. *castanea*," has been found by Mr. C. H. Morris at Lewes (Cockerell, *op. cit.*).

Var. *lateritia*, Dumont & Mortillet.—Shell pale opaque brick-red, bands reddish and translucent, peristome rose-coloured. A form of this variety with bands of a vinous tint has been described by Messrs. Taylor and Roebuck under the name *vinosofasciata*. Lewes (J. H. A. Jenner).

Var. *citrinozonata*, Cockerell.—Worthing (B. M. Oakshott); Lewes (C. E. Wright).

Var. *fuscolabiata*, Taylor.—Lewes (C. E. Wright).

Monst. *sinistrum*, Férussac.—A single shell at Chichester (J. C. Melvill).

H. hortensis, Müller.—Generally distributed. Noted by Mr.

F. Dixon from the post-Pliocene beds at Bracklesham Bay, and by Mr. Alfred Bell from the "mud deposit" of Holocene age at Selsea. Large forms have been taken by Mr. C. E. Wright at Cocking.

Var. *lutea*, Moquin-Tandon.—Widely distributed.

The subvar. *lutescens* has been recorded from Brighton by Mr. J. Kidson Taylor, and from Eastbourne by the Rev. S. Spencer Pearce.

Var. *ludoviciana*, Moquin-Tandon.—Lavant (C. E. Wright).

Var. *olivacea*, Taylor.—Littlehampton (D. Taylor).

Var. *incarnata*, Moquin-Tandon. — Ore, Hastings (A. J. Alletsee); between Robertsbridge and Hurst Green (T. D. A. Cockerell); Midhurst (Cockerell); Lavant (C. E. Wright); Littlehampton, Graffham, and Charlton Forest (D. Taylor).

Var. *nigrolabiata*, Taylor.—"Ratham, near Chichester; pure yellow unbanded shells, strictly localized, and occurring with var. *fuscolabiata*, June, 1883, W. Jeffery" (Taylor, 'Monograph,' iii. 359).

Var. *roseolabiata*, Taylor. — Harting (J. Weaver); Lewes (Jenner); Barcombe (Hillman); Uckfield (Morris); Worthing (Oakshott); Bexhill (Rufford Collection, Hastings Museum).

Var. *fuscolabris*, Kreglinger.—Ore, Hastings (A. J. Alletsee); between Battle and Hastings (Cockerell); Ratham and Chichester (Jeffery); West Blatchingdon (R. M. Christy).

Var. *alba*, Picard.—Worthing (B. M. Oakshott).

Var. *luteolabiata*, Cockerell.—Hastings and Lavant (C. E. Wright).

Var. *fusca*, Poiret (= *baudonia*, Moquin-Tandon).—Mountsfield, Robertsbridge, and Lamberhurst (T. D. A. Cockerell).

Var. *citrinozonata*, Taylor.—Lavant (C. E. Wright).

Var. *roseozonata*, Cockerell.—Lavant, B. F. 10005 (C. E. Wright); Eastbourne (Rev. S. Spencer Pearce).

Var. *bimarginata*, Taylor.—Erringham (R. Miller Christy).

H. pisana, Müller.—The inclusion of this species in the Sussex list rests upon three specimens found in a box labelled "*H. pisana*, Sussex, Mr. W. Hawker, 1850," amongst a collection of British non-marine shells formed in the fifties by the late Mr. Frederick Townsend, F.L.S. (author of the 'Flora of Hampshire'), and presented by his widow to the Haslemere Museum a few years ago. Unfortunately Mrs. Townsend is unable to give further information concerning them. Two of the shells are the var. *undulata*, Taylor, the other approximates to the var. *sagittifera*, Taylor.

Ena montana, Draparnaud.—Very rare, apparently found only in the neighbourhood of Harting and Ditcham, close to the Hampshire border. It has been recorded from Miscombe Hanger by Mr. C. E. Wright ('Journ. Conchology,' xiii. 342).

E. obscura, Müller.—Generally distributed.

Var. *albina*, Moquin-Tandon.—On beech trees in a wood at Fitchin, near Eastbourne (Rev. S. Spencer Pearce).

Cochlicopa lubrica, Müller.—Generally distributed.

Var. *hyalina*, Jeffreys. — Chichester district (W. Jeffery); Sompting (E. W. S.).

Azeca tridens, Pulteney.—A local species. Fairlight, Hastings (A. J. Alletsee); Ringmer, near Lewes (T. S. Hillman); between Robertsbridge and Hurst Green (T. D. A. Cockerell); Hurst Green (E. A. Butler); Mountfield (Craven); Ashburnham and Robertsbridge (Hastings Phil. Soc.); abundant in a valley near Dalegate in the parish of Newtimber (W. Borrer); Harting (Weaver); Up Park (Rev. W. A. Shaw).

Var. *nouletiana*, Dupuy. — Ringmer, near Lewes (T. S. Hillman).

Cæcilioides acicula, Müller.—A subterranean species, widely distributed on calcareous soil.

Jaminia secale, Draparnaud. — Widely distributed on the chalk, and particularly abundant where juniper bushes grow.

Var. *edentula*, Taylor.—Eastbourne (J. Loydell).

Var. *pellucida*.—In the Haslemere Museum are light-coloured pellucid specimens collected by Charles Barrett, F.E.S., on Beachy Head.

J. cylindracea, Da Costa (= *Pupa umbilicata*, Drap.).—Generally distributed.

Var. *albina*, Moquin-Tandon. — "Left-hand side of road about two miles from Lewes towards Glynde" (T. D. A. Cockerell).

J. muscorum, Linné (= *Pupa marginata*, Drap.). — Widely distributed on the Downs, and in the neighbourhood of the coast.

Vertigo antivertigo, Draparnaud.—Apparently a rare species. It may be suspected that the members of the genus *Vertigo* are frequently overlooked, and in all probability more than two species occur in Sussex. Lewes Levels (W. C. Unwin); Eastbourne (Eastbourne Nat. Hist. Soc.); Pevensey (A. J. Ailetsee); Pevensey Level (A. W. Stelfox, J. C., xiii. 342); under stones in the level near Newtimber (W. Borrer); Aldsworth, near Westbourne (Rev. W. A. Shaw).

V. pygmæa, Draparnaud.—Widely distributed.

Balea perversa, Linné.—Generally distributed.

Clausilia laminata, Montagu.—Generally distributed, and, like the preceding, very abundant in beech woods.

Var. *pellucida*, Jeffreys.—Sparingly at Lewes with the type (Jenner); Charlton Forest, uncommon (E. W. S.).

Var. *albina*, Westerlund.—Not uncommon in the beech woods on the north side of Heyshott Down (E. W. S.); Coombe plantation, Lewes (J. H. A. Jenner); about Chichester (W. Jeffery).

Var. *tumidula*, Jenner.—Lewes district (Jenner); Charlton Forest (Douglas Taylor).

C. bidentata, Ström (= *C. rugosa*, Drap.). — Generally distributed.

Var. *albina*, Moquin-Tandon.—Eastbourne (A. G. Stubbs).

Var. *parvula*, Turton.—Lewes, frequent (W. C. Unwin).

Var. *glacilior*, Jeffreys. — Landport, near Lewes (J. H. A. Jenner); Battle and between Robertsbridge and Hurst Green (T. D. A. Cockerell).

C. rolphii, Leach (in Turton).—Widely distributed.

Var. *curta*, Jenner.—Ringmer, near Lewes (J. H. A. Jenner); Coghurst Wood (Raph Tate).

Monst. *decollata*, Jenner.—Lewes, with the type (J. H. A. Jenner).

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

Stoat Swimming after its Prey.—On a pond in an orchard in front of my house a pair of Moorhens have hatched their young. Frequently I have heard their loud alarm notes warning their yor of danger, and have watched a Stoat make many visits to the pool fruitlessly, although possibly not always so, as their young are now two less in number than formerly. When the brood have been warned, if away from the water, they quickly return and remain in the middle of the pond until they are satisfied the Stoat has left the vicinity. But in one instance I watched one of the adult birds, whilst defending its young, swim towards the Stoat to within a few feet of the water's edge, when the latter immediately took to the water and boldly swam out after the Moorhen until it satisfied itself that further pursuit was hopeless.—J. Steele Elliott (Dowles Manor, Salop).

Grey Squirrel in Buckinghamshire.—When I was walking along a path leading through a small wood, part of Whaddon Chase, between Buckingham and Fenny Stratford, on May 11th, 1915, I saw a Grey Squirrel. I do not know if this species has been introduced there, or if this individual had wandered from the site of some other undesirable introduction of this rodent.—O. V. Aplin (Bloxham, Oxon).

Remains of Roe-Deer, &c. — When visiting that wonderfully beautiful old house called Stokesay Castle, near Craven Arms, last year, I was shown some Roe-Deer horns which had been found in a well in the north tower. In one of the ruined towers of Ludlow Castle I saw the top part of the skulls and horn-cores of some cattle which were very massive and broad, but I had not time to examine them carefully.—O. V. Aplin.

AVES.

Cuckoo Problems.—In the 'Zoologist' (*ante*, p. 316), Mr. Steele Elliott, referring to the many interesting but more or less doubtful points in the economy of the Cuckoo, states that he has never known an instance of the Cuckoo's egg having been placed in the nest of its dupe before one at least of the rightful owner's had been previously laid, and he thinks that where a Cuckoo's egg only has been found in a nest, the probability is that the egg of the foster parent has been removed. I quite agree with Mr. Steele Elliott that individual Cuckoos may remove the only egg from the nest of the dupe previous to depositing their own egg, as there is no limit to the eccentricities of individual Cuckoos; but there are many instances where this cannot apply, since many of the Cuckoo's eggs have been known to be deposited in nests which have been very far from complete, and in some cases even in deserted nests. In two instances, at least, the nests of Reed-Warbler and Pied Wagtail or Hedge-Sparrow were in such a condition when the Cuckoo's egg was deposited, that when the nests were complete, the Cuckoo's egg was nearly buried, and Mr. Pattingham even goes so far as to say that in every case he has known, the Cuckoo's egg has been laid in an empty nest. When I was at Hastings Museum a few years ago one of my sons told me he has known in that district of a Cuckoo laying its egg in the empty nest, I think he said, of a Willow-Warbler. Mr. Steele Elliott further states that he knows that the Cuckoo will deposit its egg several days after the foster parents have started incubation; but what is known of the longest time allowed to elapse before so doing? Personally, he believes the time is limited. In the 'Naturalist' for 1886, Mr. Whitlock records the finding of a Meadow-Pipit's nest containing two of its own eggs and one of the Cuckoo. The Cuckoo's egg was quite fresh, whilst the Pipit's eggs were within about three days of being hatched.

In the 'Zoologist,' 1898, p. 430, Mr. Devenport records a Cuckoo laying an egg in a Meadow-Pipit's nest in Arran; the nest of the dupe contained but one egg, and that in an advanced stage of incubation. Mr. Steele Elliott asks: "how many eggs of the foster parent are usually removed by the Cuckoo, and what actually becomes of them"? From my own observations I have found that as a rule one egg only has been removed, but again there is no limit to the vagaries of individual Cuckoos, but I believe that only in exceptional instances are more than two eggs removed. In nests where I have found two Cuckoos' eggs, the presumption has always been that two eggs of the rightful owner have been abstracted.

In the Hastings Naturalists' 'Transactions' for 1909 a nest of the Pied Wagtail is recorded with four eggs of the rightful owner and one Cuckoo's egg. Two days previously the Wagtail's nest contained six eggs of the rightful owner. With the exception of superior size the Cuckoo's egg exactly matched the Wagtail's. A very great number of instances could be given, if it were necessary, to prove that usually one egg is abstracted by the Cuckoo when it introduces its egg into the nest of its dupe; in some instances the Cuckoo has been seen with the egg in its beak. Indeed, the proof of the removal of at least one egg of the dupe by the Cuckoo, when it foists its egg on the nest of its victim, is so great as to practically amount to a demonstration. The next question Mr. Steele Elliott raises is, What becomes of the egg or eggs taken by the Cuckoo out of the nest of its victim? I have no hesitation in affirming my belief that they are eaten by the Cuckoo, although I am aware that this is stoutly denied even by at least some naturalists of high repute. How are we to account otherwise for the number of egg-shells found in the neighbourhood of nests, which have lost one or more eggs through abstraction by Cuckoos? Moreover, we have it on the authority of Mr. Nelson recorded in the 'Field' of January 28th, 1882, that on skinning a Cuckoo he found its crop full of eggs; and in writing of the birds of the Norfolk Broads, Mr. Emerson says he found in the crops of Cuckoos what appeared to be yolk of eggs (see Mr. Gurney on the Economy of the Cuckoo). A good many other instances might be given in confirmation of this egg-eating propensity on the part of the Cuckoos. I should not, however, like to assert that its common habit is to eat eggs other than from those nests which it victimizes. A good many other points in the life-history of the Cuckoo require elucidation, amongst which might be mentioned the following:—

1. Is the well-known double note peculiar to the male?

2. How many eggs are usually laid in a season?

3. What interval elapses between the laying of each egg, and is this regular or irregular?

4. Does the Cuckoo confine its attention chiefly to one species in any one district?

5. After the laying of its eggs in the nest of its dupe, does the Cuckoo ever take any interest in its future progeny?

6. Has the Cuckoo ever been known to incubate its own egg?

7. Does the Cuckoo lay in the nests of a greater number of species than it formerly did?

8. Does the Cuckoo sometimes remove the nestlings of birds?

9. Is the Cuckoo polyandrous to the extent that it is usually asserted to be?

I should be very glad to receive information from any of your readers as to the number of species of birds the Cuckoo victimizes in any given district, or even the dominant species. The life-history of the Cuckoo is an inexhaustible subject, as well as a very fascinating one, notwithstanding its questionable morals. It has received and is receiving more attention from naturalists than any other British bird, and the true story of this most sphinx-like of all birds is emerging into clear outline. Much, however, still remains to be learned. The actual, in relation to the possible facts of its economy, are still scanty, and in approaching this subject one thing should be kept in view, not to infer the general from the particular as has often been done in the past.—E. P. BUTTERFIELD.

Singular Nest of Willow-Warbler.—In the 'Zoologist' for August, p. 116, Mr. Warde Fowler mentions the nest of this species at some distance from the ground. I have met with three instances—one built in the upper angle of two rocks, one on the top of a whin bush, and the last built in the boss of twigs which sometimes grows around the boles of oak trees—trees whose growth has been arrested by a more or less barren soil.—E. P. BUTTERFIELD.

I see in your August issue, p. 316, a note regarding the singular position of a Willow-Wren's nest. In 1912 I found one in almost a more remarkable place—in a small white cluster rose trained over a wire archway in our garden, and about nine feet high, and on the very top. The nest contained eggs.—C. F. JOHNSON (Brampton, Cumberland.)

Blue Variety of Cuckoo's Egg in Hedge-Sparrow's Nest.—It is with unfeigned delight I record the finding in this district of the blue type of egg of the Cuckoo (*Cuculus canorus*). It makes the record all the more interesting, because the type of Cuckoo's egg found in this district is fairly constant, and approximates in size and colour to that of the Sky-Lark. The circumstances under which it was found were as follows:—I was on my way to Eldwick with my wife in early July last on the footpath which skirts the south, that is the Cottingley side, of Bingley Wood, when my wife called my attention to a small bird which was threading its way through a rose-bush a little away from the footpath, and on going to the bush I found the bird, which was a Hedge-Sparrow, sitting on a nest, and motioned for my wife to come and see the nest; but before she had arrived the bird had left the nest, which revealed four eggs. I took the eggs out of the nest, and to my astonishment one of the eggs, by its superior size, shape and texture, was undoubtedly the egg of a Cuckoo. I have never previously found the egg of the Cuckoo deposited in the nest of the Hedge-Sparrow, though I have carefully searched for one for over forty years, and have known their nests with fresh eggs close to a garden which Cuckoos have frequented in abundance in quest of larvæ of the Gooseberry Moth. I have found the egg of the Cuckoo in the nest of the Whinchat, but never found one in this case which can be said to have approximated in the least degree to that of the dupe. It is remarkable that the blue egg of the Cuckoo is so exceedingly rare in Britain, and yet comparatively common in some parts of the Continent, and is strange, passing strange, that in those species which are commonly victimized by the Cuckoo in Britain, with the exception of the Hedge-Sparrow, the eggs are marvellously protective in colouration. We may, however, be sure that the egg of the Cuckoo has already undergone, and is at present undergoing, a process of adaptation in colouration, not by the volitional power of the Cuckoo, as has been supposed, but by the fosterers elimitating those eggs of the dupe which contrast most markedly with those of the rightful owners, and by this means those Cuckoos which lay badly matched eggs will gradually die out. It would be interesting to know whether the Cuckoo in Britain lays its egg in the nest of the Hedge-Sparrow as commonly as was formerly the case.—E. P. Butterfield (Wilsden).

PISCES.

Tameness in Several Blennies.—It is well known that the Common Blenny or Shanny (*Blennius pholis*) is an unusually intelligent fish, and that it soon becomes tame in an aquarium, but records of the precise length of time which may elapse before the Blenny begins to watch for food and to come to be fed from the hand are rarely made. The following facts seem to me to be noteworthy:—(1) A recently caught Blenny was placed in an aquarium which contained several tame individuals. It watched, from the shelter of a rock, the other Blennies crowding to the surface to be fed with beef from my fingers on the second day of its residence in the aquarium. On the third day no food was offered to the fishes, but on the fourth day the newcomer swam up with the others to be fed, without showing any fear. (2) Two Blennies were placed in an empty tank on May 3rd, and on the following morning they were each given in wooden feeding-forceps a piece of beef, which they took after a little hesitation. On their fourth day they were given more beef, which they took eagerly. From then until the present time (July 17th) they have always come up to the surface to be fed whenever the cover of the aquarium is removed. A third Blenny was put into their tank on July 1st. It watched the others, and came up to be fed on its second day. All the Blennies studied by me, excepting unhealthy individuals or those which had been injured during capture, have learned to come to be fed from my fingers within a few days—certainly within ten days—but I have unfortunately omitted to keep a record of dates. It may be stated generally that, when once a Blenny has been induced to take food from the forceps, it thereafter begins to look for food whenever its tank is tended; and that, if tame individuals are already present, a new Blenny learns to come for food more quickly than it would do if it were alone in the tank. It is my custom to knock at the glass front of the aquarium before feeding the Blennies, and they soon learn to look for food whenever the glass is tapped. One consequence of this is that, if the fishes have not recently been fed, a touch of the hand of a visitor upon the glass often suffices to bring the Blennies crowding to the front, where they will swim eagerly about, or sit and stare at him in a very amusing and characteristic manner. I know of no other British fish which becomes tame so quickly as does the Blenny.—H. N. Milligan.

Tameness in a Sea-Bullhead.—A female Bullhead (*Cottus bubalis*) was placed in an aquarium on January 23rd. For the first three days it was shy and refused to feed, but on the fourth day it quickly seized and swallowed a piece of raw beef dropped close to its head. A second piece of beef presented to it in wooden feeding-forceps immediately afterwards was also swallowed. From the fourth day until within a few days of its death on May 9th it always took its food (beef, Shrimps, Prawns, small Crabs) very readily from the forceps, and even so soon as by the end of the first week of captivity it had begun to look eagerly upwards when the top of the aquarium was removed and the forceps introduced into the tank.—H. N. Milligan.

MOLLUSCA.

Wandle Freshwater Shells.—With regard to the list of freshwater shells found at Beddington Corner, on the Wandle, which list is in the Grange Wood Museum, South Norwood, I have found lately these additional species, *Limnæa stagnalis*, *Planorbis vortex*, *carinatus*, *Bithynia tentaculata*, *Valvata piscinalis*, *Sphærium corneum*, *Pisidium amnicum*, not mentioned in the list.—G. F. Brown (Anerley).

CRUSTACEA.

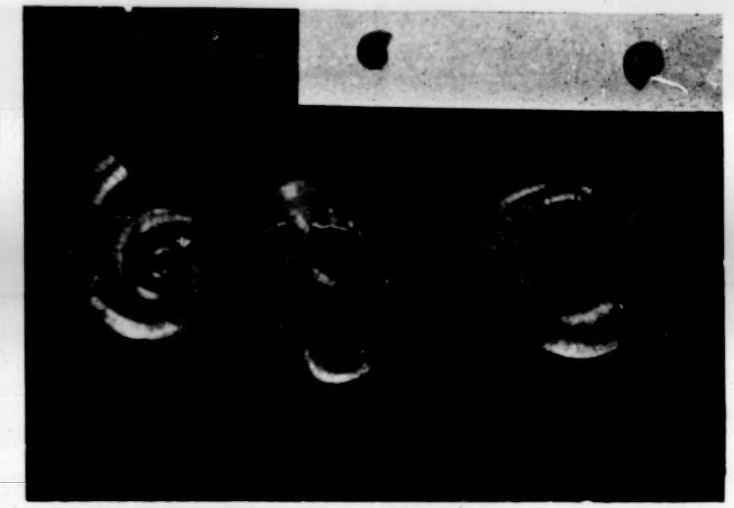
Hardiness in the Common Prawn, Æsop Prawn, and Shrimp.—I have frequently had occasion during the last three years to notice that the Common Prawn (*Palæmon serratus*) and the Shrimp (*Crangon vulgaris*) are very hardy inhabitants of an aquarium, whereas the Æsop Prawn (*Pandalus annulicornis*) is very delicate. Two observations upon this point may be given:—(1) On March 19th several Æsop Prawns were brought from the seaside in the same collecting-can with about an equal number of Common Prawns. Both kinds of Prawns were subjected to the same conditions during capture in the dredge and carriage home in the can, and both kinds were put into the same tank. Within a few days all the Æsop Prawns were dead, the majority of them apparently dying from the effects of the journey, whilst the others were killed and eaten by the Common Prawns. Some of the latter are still (July 17th) alive. (2) On May 19th six Common Prawns, twenty-seven Æsop Prawns, and thirty Shrimps mixed together were brought in two collecting-cans from the seaside. At the end of the five hours' journey it was found that none of the Common Prawns and only two of the Shrimps were dead, but that twelve Æsop Prawns had died. The six Common Prawns were put into one tank, and four of them are still (July 17th) alive. The Æsop Prawns and Shrimps were put into another tank. By the end of May all the Æsop Prawns were dead, with the exception of one individual which lived until the middle of June, most of them apparently dying from the effects of the journey, and some of them being killed and eaten by the Shrimps. All the Shrimps are still alive. As an example of the hardiness of the Shrimps, it may be recorded that when they were being dropped into their aquarium on the night of the 19th, one of them happened to fall upon a dead Æsop Prawn, which it straightway began to eat. A few minutes later another Shrimp had begun to eat another dead Æsop Prawn. The experiences of other aquarium-keepers on this point would be interesting,—H. N. MILLIGAN.

INSECTA.

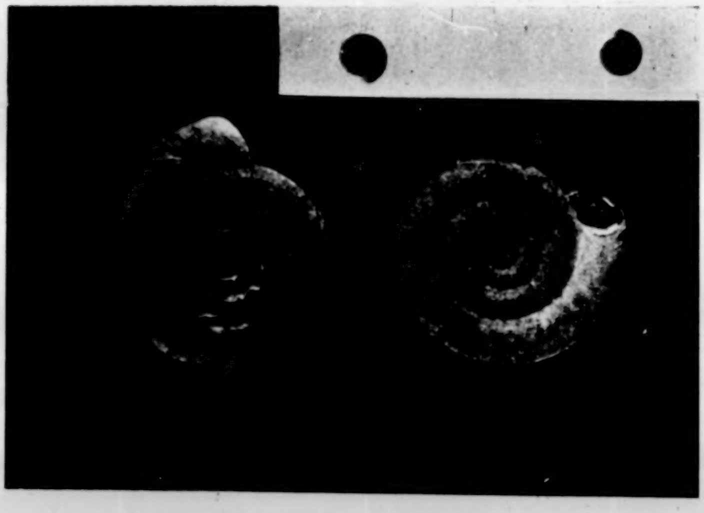
Acanthocinus ædilis at Sydenham.—On July 21st Mr. W. A. Fowler, of Sydenham, submitted to me for identification a living male individual of the beetle known as *Acanthocinus ædilis*. Mr. Fowler explained that he had found the beetle "in a sack of sugar exported from the West Indies," and that it had come over in a boat carrying a general cargo.—H. N. MILLIGAN.

ERRATA.—Page 317, line 19 from bottom, for four eggs read five.

BRITISH 8 OCT 15 MUSEUM



VALVATA MACROSTOMA, Steenb.



PLANORBIS VORTICULUS, Troschel.

Photos H. D. Gower.

SUSSEX MOLLUSCA.